

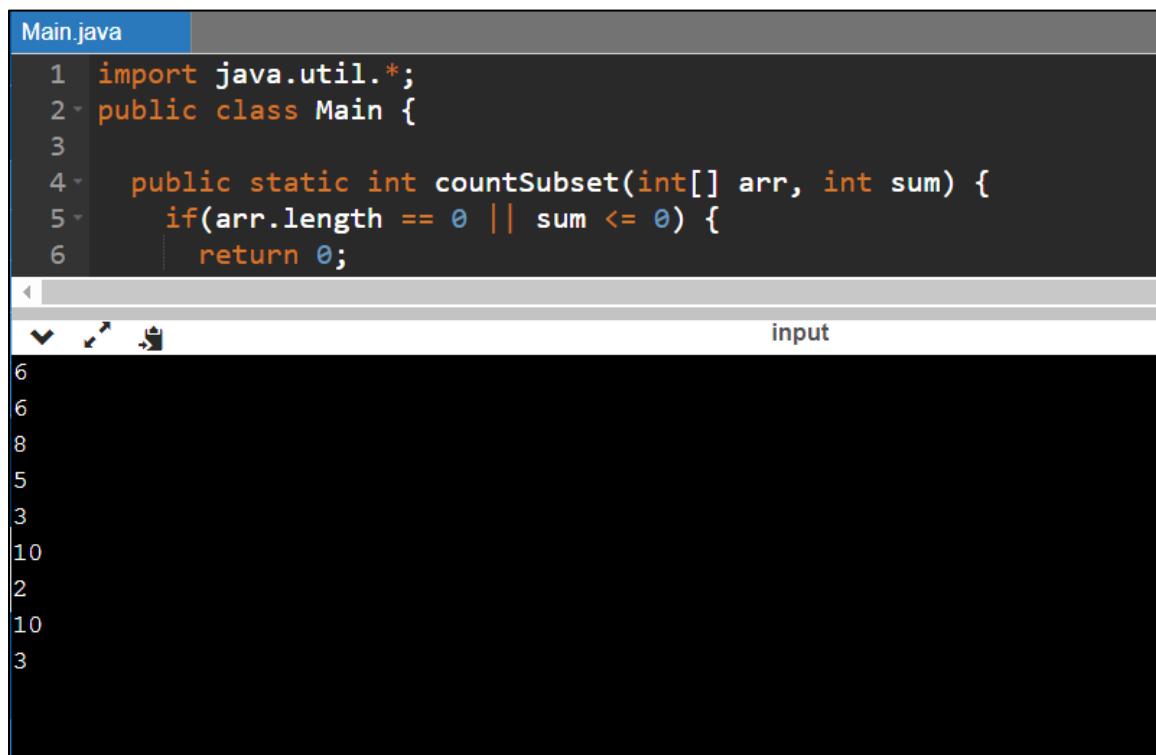
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## Lab Assignment 2

### Question 1

*Program to count subsets with sum equals to the given number using Recursion*



The screenshot shows a Java IDE with a file named 'Main.java'. The code is as follows:

```
1 import java.util.*;
2 public class Main {
3
4     public static int countSubset(int[] arr, int sum) {
5         if(arr.length == 0 || sum <= 0) {
6             return 0;
7         }
8     }
9 }
```

Below the code editor, there is an 'input' section with the following values:

```
6
6
8
5
3
10
2
10
3
```

```
import java.util.*;
```

```
public class Main {
```

```
    public static int countSubset(int[] arr, int sum) {
```

```
if(arr.length == 0 || sum <= 0) {  
    return 0;  
}
```

```
int n = arr.length;
```

```
int[][] count = new int[n][sum + 1];
```

```
for(int i = 0; i < n; i++) {  
    count[i][0] = 1;  
}
```

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```
for(int j = 0; j <= sum; j++) {  
    if(arr[0] == j) {  
        count[0][j] = 1;  
    }  
}
```

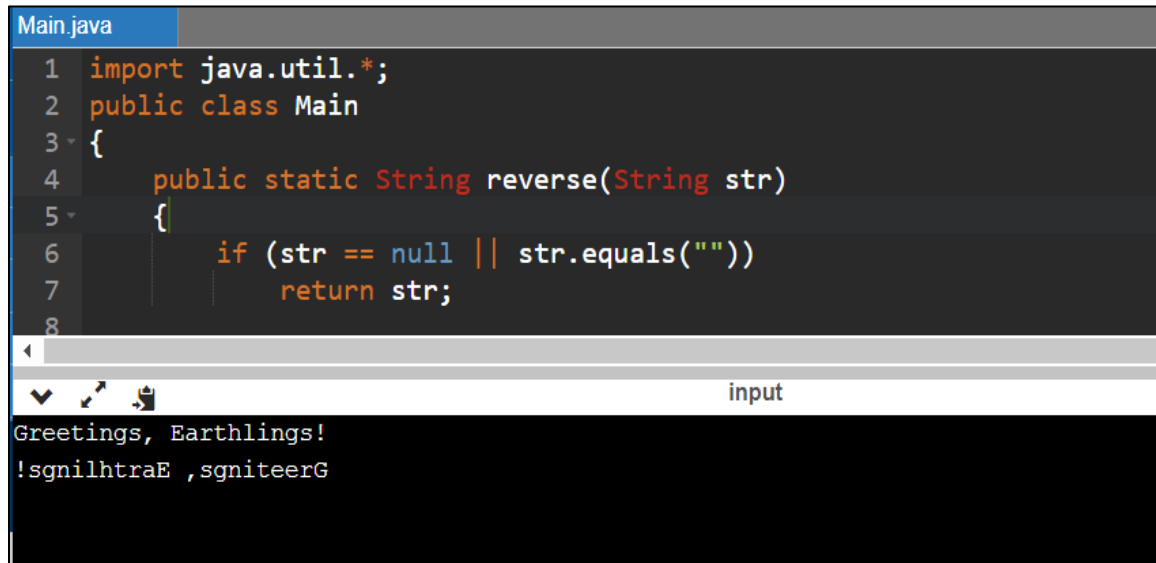
```
for(int i = 1; i < n; i++) {
```

```
for(int j = 1; j <= sum; j++) {  
  
    int p = 0;  
    int q = 0;  
  
    if(arr[i] <= j) {  
        p = count[i - 1][j - arr[i]];  
    }  
  
    q = count[i - 1][j];  
  
    count[i][j] = p + q;  
}  
  
return count[n - 1][sum];  
}  
  
public static void main(String[] args) {
```

```
int n;  
  
Scanner s = new Scanner(System.in);  
  
n = s.nextInt();  
  
int arr[] = new int[n];  
  
for(int i = 0; i < n; i++)  
{  
    arr[i] = s.nextInt();  
}  
  
int number;  
  
number = s.nextInt();  
  
System.out.println(countSubset(arr, number));  
  
}  
  
}
```

## Question 2

### *Program to Reverse a String using Recursion*

A screenshot of a Java IDE window titled 'Main.java'. The code is as follows:

```
1 import java.util.*;
2 public class Main
3 {
4     public static String reverse(String str)
5     {
6         if (str == null || str.equals(""))
7             return str;
8     }
```

The IDE has a dark theme. Below the code editor, there is an input field with the text 'Greetings, Earthlings!'. The output area shows the reversed string: '!sgnilhtraE ,sgniteerG'.

```
input
Greetings, Earthlings!
!sgnilhtraE ,sgniteerG
```

```
import java.util.*;

public class Main

{

    public static String reverse(String str)

    {

        if (str == null || str.equals(""))

            return str;
```

```
int n = str.length();
```

```
char[] temp = new char[n];
```

```
for (int i = 0; i < n; i++)
```

```
    temp[n - i - 1] = str.charAt(i);
```

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```
return String.valueOf(temp);
```

```
}
```

```
public static void main(String[] args)
```

```
{
```

```
    Scanner sc = new Scanner(System.in);
```

```
    String str = sc.nextLine();
```

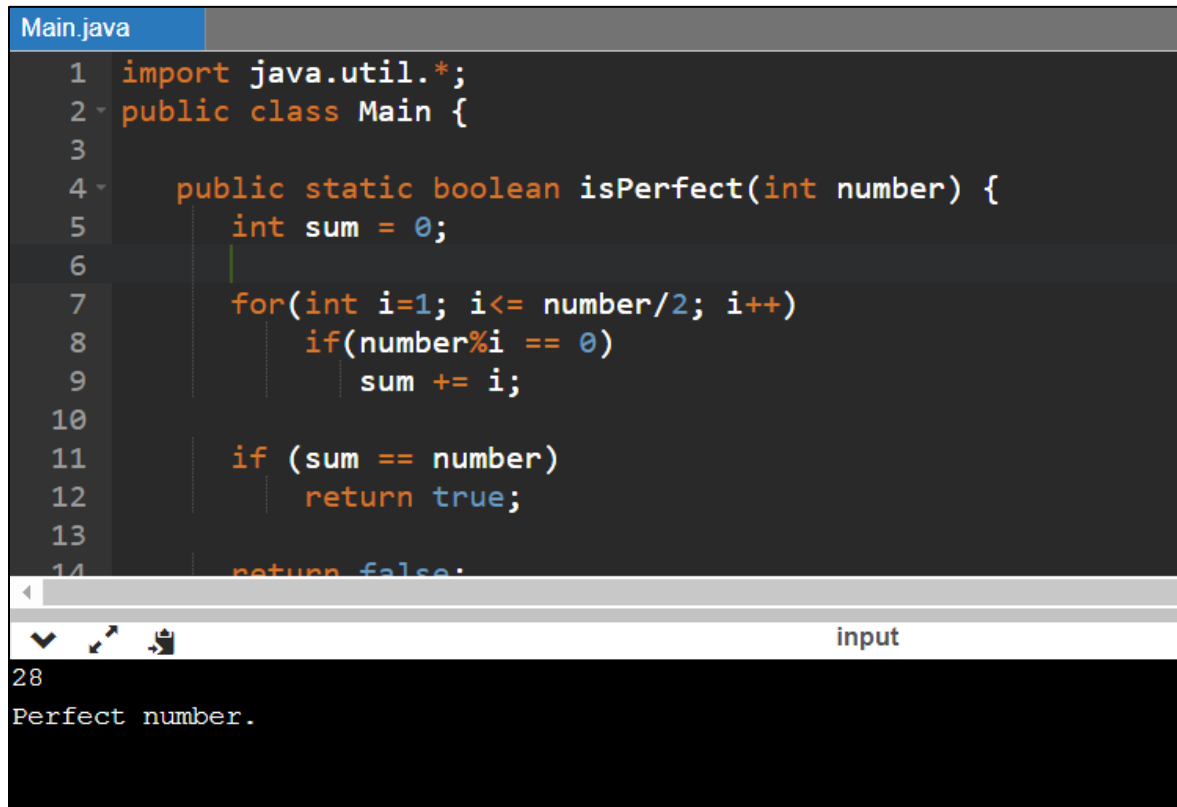
```
    str = reverse(str);
```

```
    System.out.println(str);
```

```
}  
  
}
```

### Question 3

*Program for checking if a number is perfect number or not*

A screenshot of a Java IDE window titled 'Main.java'. The code is as follows:

```
1 import java.util.*;  
2 public class Main {  
3  
4     public static boolean isPerfect(int number) {  
5         int sum = 0;  
6  
7         for(int i=1; i<= number/2; i++)  
8             if(number%i == 0)  
9                 sum += i;  
10  
11         if (sum == number)  
12             return true;  
13  
14         return false;  
15     }  
16 }  
17 }
```

Below the code editor, there is an 'input' field with the value '28' and an output area displaying 'Perfect number.'

```
import java.util.*;
```

```
public class Main {
```

```
    public static boolean isPerfect(int number) {
```

```
        int sum = 0;
```

```
for(int i=1; i<= number/2; i++)  
    if(number%i == 0)  
        sum += i;  
  
if (sum == number)  
    return true;  
else  
    return false;  
}  
  
public static void main(String[] args) {  
    int number = 0;  
    boolean result = false;  
  
    Scanner sc = new Scanner(System.in);  
  
    number = sc.nextInt();  
  
    result = isPerfect(number);
```



```
    if(result)
        System.out.println("Perfect number.");
    else
        System.out.println("Not a Perfect number.");
    }
}
```

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